



SaskAuto

The logo features the word "SaskAuto" in a bold, sans-serif font. The "Sask" portion is in a standard weight, while "Auto" is in a slightly lighter weight. The text is white and set against a dark background. Above the text are four horizontal white lines, and below it is a single thick white horizontal bar.

A Report to:
Traffic Safety Services
SaskAuto

Saskatchewan's 1987
Night-Time
Driver Survey

from:
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The contents of this report reflect the views of the author and are not necessarily the official views or policies of the Saskatchewan Government Insurance Motor Vehicle Division.

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Summary

In the Spring of 1987 a Night-time Driver Survey was carried out in Saskatchewan. The survey took place between May 28 and June 21, 1987, from 9:00 p.m. to 3:00 a.m. on Wednesday, Thursday, Friday and Saturday Nights.

Ninety-six sites were sampled, in and around towns and cities with populations of 5000 or more. Each site was sampled for 1 1/2 hours.

A total of 4,077 vehicles were sampled from 17,251 passing vehicles. Police Officers directed vehicles into the sites. Interviewers introduced themselves as being from the University of Saskatchewan and requested the drivers' co-operation to take part in a voluntary, confidential, survey.

93.9 % of all drivers completed the interview. Approximately 1.9% of all drivers declined to take part in the interview and a further 4.1% either declined to provide a breath sample, or were unable to provide a satisfactory breath sample.

Information was gathered concerning the province issuing the licence plate, the vehicle type, the gender of the driver, driver seat belt use, and number of occupants. Drivers were asked questions relating to: what kind of a place (s)he had started out from, trip length, driver age, subjective probability of apprehension of impaired drivers, the number of alcoholic drinks consumed within the last seven days, attendance at a Driving Without Impairment (DWI) course, and licence suspension for impaired driving. For drivers found to be drinking, further questions were asked concerning: their estimation of whether they were over the legal limit, the kind of place where most of their drinking was done, attempts by others to discourage them from driving, and, use of a designated driver.

A breath sample was obtained from all co-operating drivers, using a J4 digital A.L.E.R.T. This was similar to the roadside screening device used by the police, but provided a three figure numeric readout, rather than just an indication of pass/warn/fail.

For those drivers whose Blood Alcohol Concentration (BAC) was in excess of 60 mg%, an alternative method of transport home was found.

Data was weighted to provide an accurate provincial estimate, by compensating for population and traffic-flow differences at the various sites.

The data were analysed in two ways: according to the legal BAC limits and according to the pre-set BAC limits on the roadside screening devices used by the police. Legal limits provide a theoretical measure of impairment; roadside screening device limits provide a practical measure of impairment.

The following are the key results of the survey:

- Over the entire period of the survey, 3.6% of drivers, or one driver in 28, had a BAC 81 mg% or over and could, theoretically, have received a charge for having a BAC in excess of 80 mg%.
- Over the entire period of the survey, 2.1% of drivers, or one driver in 47, had a BAC between 60 and 80 mg % and could, theoretically, have received a 24 hour suspension.
- Over the entire period of the survey, 5.7% of drivers, or one driver in 18, had a BAC in excess of 60 mg %; that is, they were over the limit recognized in Saskatchewan as producing driving impairment.
- For Wednesday, Thursday, Friday and Saturday nights combined, between 1:30 and 3:00 a.m., 14.4% of drivers, or one driver in seven, had a BAC in excess of 80 mg%, and a further 4.4%, or one driver in 23 had a BAC between 60 and 80 mg%.
- On Friday nights, between 1:30 and 3:00 a.m. (Saturday morning), 17.9% of drivers, or approximately one driver in six reached or exceeded the 100 mg% BAC level used by the police in their roadside screening devices.
- For those drivers with BACs of 81 mg% and over, 50.4%, or half of them, had done most of their drinking in bars, clubs or taverns.
- For those drivers with BACs between 60 and 80 mg%, 38.6%, or one driver in three, had done most of their drinking in bars, clubs or taverns.
- When impaired drivers were asked if they thought they were over the (80 mg%) legal limit, about 40 % of those actually over the limit said "Yes". This means that 60% of those drivers either did not think they were over the limit, or did not care to admit it.

For the comparison of 1981 and 1987 data statistical tests (t-tests) were undertaken. Those comparisons where the probability of a difference was equal to, or in excess of 95%, the difference was considered a "real", or "significant" one.

- For the whole period of both surveys, there was no significant difference in the percentage of drivers (3.2% in 1981 and 3.6% in 1987) who had BACs 81 mg% and over. However, when the data were split into the categories the police use, there was a **significant increase** in the percentage of drivers with BACs 100 mg% and above (from 1.9% in 1981 to 2.7% in 1987). This means that there was an increase in heavy drinking.
- For the whole period of both surveys, the proportion of drivers with BACs, in between 60 and 80 mg% was **significantly reduced** (from 2.9% in 1981 to 2.1% in 1987).

- In the four age groups compared (15 to 24, 25 to 39, 40 to 59, and 60 and over) the proportion of drivers, with BACs 81mg % and over, or 60 to 80 mg%, did not change significantly between 1981 and 1987.
- While the percentage of female drivers with BACs 81 mg%, and also between 60 and 80 mg%, declined between 1981 and 1987, the size of the decline was not significant.
- Males were drinking to higher levels of impairment before driving in 1987 than they were in 1981. The percentage of males with BACs in excess of 80 mg% increased, but not significantly. However, when the data were split into the police categories, there was a **significant increase** in the proportions of males with BACs 100 mg% and above from 2.2% in 1981 to 3.0% in 1987. The proportion of males with BACs between 60 and 80 mg% **significantly declined** from 3.3% in 1981 to 2.3% in 1987.
- On Friday nights **significantly more** drivers (3.3% in 1981 and 5.8% in 1987) drove with BACs 81 mg% and over. However, on Friday nights **significantly fewer** drivers (from 3.6% in 1981 to 2.4% in 1987) were driving with BACs between 60 and 80 mg%. It would seem that, in 1987, drivers were drinking to higher levels of impairment on Friday nights, than in 1981.
- There were no significant differences, between 1981 and 1987, in the proportions of drivers with BACs 81 mg% and over, or with BACs between 60 and 80 mg% on Wednesday, Thursday, and Saturday nights.

It would seem that the overall proportion of drivers who would be considered as being legally impaired in Saskatchewan (that is, with BACs over 60 mg%) has not changed dramatically between 1981 and 1987.

What has changed, is the degree of impairment of those drivers. Fewer drivers are in the 60 to 80 mg% category and more are in the 81 mg% and over category. This may be associated with an increased tendency to drink to impairment in bars, clubs and taverns.

It may be useful to educate heavy drinkers so that they know when they are impaired beyond the legal limit. The new breath-test device designed for use in bars could prove helpful.

If one can assume that the probability of being in an accident with an impaired driver is related to the proportion of impaired drivers who are on the road, then **all** drivers should take extra care when driving after midnight. Even more care is required as the hour becomes later.

On Friday nights, (or Saturday morning) between 1:30 and 3:00 a.m. every sixth vehicle contains a driver who is impaired to the point that (s)he could be charged by the police under the Criminal Code of Canada. For the police, an opportunity exists to instigate some selective enforcement. From an individual's standpoint a good strategy might be to simply avoid driving at all during this time period.

1. Introduction

Saskatchewan's first Night-time Driver Survey took place in 1974. This was a survey conducted by Transport Canada in which Saskatchewan's results were part of a "Prairie" sample.

In 1981, as part of a joint Federal-Provincial initiative, a second survey was conducted. This survey was specifically designed to estimate a number of night-time driving behaviours in Saskatchewan.

In 1987, a second survey was conducted, which also gave a Saskatchewan estimate. Again, this was a joint Federal-Provincial effort. It is this survey, and the comparison with the 1981 survey, that is being reported upon here.

Legitimate comparisons between surveys are not always possible. However, in this case, a comparison between 1981 and 1987 is statistically legitimate and meaningful, precisely because the surveys were designed to make comparison legitimate and meaningful.

The (1987) survey was, indeed, a Night-time Driver Survey, obtaining a variety of measures from the drivers. Information was collected on: exposure of various age groups, basic demographic information such as age and gender, driver seat belt use, the number of vehicle occupants, and drivers' responses to alcohol-related questions.

The primary emphasis of the survey was, however, on alcohol. Every driver whose participation in the survey was counted, provided a breath sample for on-the-spot analysis for alcohol content. Beside the basic information on the extent of driving after drinking, the power of this survey comes from our ability to look at all of the other night-time information gathered, broken down for the groups representing different levels of alcohol impairment.

The primary goals of the survey were, then: (1) to accurately estimate the proportion of Saskatchewan's night-time driver population who had been driving after drinking; and (2) to determine the extent of impairment (measured in units of Blood Alcohol Concentration) of that population.

The secondary goals, were: (3) to obtain estimates for Saskatchewan of the non-alcohol-related information, such as age of drivers on the road; and, (4) to compare that information for the various impairment groups.

Preparations began for the survey in 1986, but the survey itself was deferred until the Spring of 1987.

The joint participation was split as follows: SaskAuto provided the co-ordination and organization for the survey. The field work was contracted to the Transportation Centre of the University of Saskatchewan, Saskatoon. The Transportation Centre provided the day to day organization and management, personnel, vehicles, equipment, travel and data collection for the survey. Transport Canada provided the survey design and analysis, the breath-test

equipment, and consultants, who were versed in the survey, to train and to monitor the survey.

2. Methodology

2.1 Site Survey Time

2.1.1 Season and Dates

The results of the survey are most useful if they apply directly to the permanent residents of Saskatchewan. Therefore, the survey was carried out in the spring, when tourist traffic was minimal.

The survey began May 28 and was concluded on June 21, 1987.

2.1.2 Night of Week

The survey was conducted on Wednesday, Thursday, Friday and Saturday nights. When the surveys were originally conceived (in the 1970's) these four days were chosen to represent "week" (Wednesday and Thursday) and "weekend" (Friday and Saturday) nights. Since that time the concept of the "weekend" has become less clear.

2.1.3 Time of Night

The survey was conducted between 9.00 p.m. and 3.00 a.m.

2.1.4 Time on Site

Each site was sampled only once, for one and a half hours. The survey time was divided up as follows:

- period 1 - 9.00 p.m. to 10.30 p.m.
- period 2 - 10.30 p.m. to midnight
- period 3 - midnight to 1.30 a.m.
- period 4 - 1.30 a.m. to 3.00 a.m.

2.2 Sample size

2.2.1 Vehicles Selected and Traffic Count

A total of 4,077 vehicles were sampled from 17,251 passing vehicles. That is, 23.6% of all vehicles passing the survey sites were sent into the sites.

2.2.2 Sample Size

A total of 3,830 drivers volunteered to answer the questions and also provided a sample of their breath. This number made up the group whose data are

analysed in this report. For the 96 sites, an average of 40 interviews were obtained for each one and a half hour period.

2.3 Site Allocation and Sampling

2.3.1 Towns and Cities Sampled.

Of the 13 towns and cities in Saskatchewan with populations of over 5000, 12 were sampled (see Table 1). Only Swift Current was omitted, for no reason other than the geographical requirements for blocks of 16 sites (see Appendix A for the Sampling Design). For all intents and purposes, then, the survey was a measure of the total population of towns and cities, rather than a sample. Table 1 indicates the sites planned and completed in each town or city.

Where it was feasible, we tried to locate up to 20% of the sites outside the boundaries of the town or city, and within a 20 minute drive from the city boundary.

Table 1. Towns and Cities Sampled

Town/City	# of Sites
Regina	16
Saskatoon	16
Moose Jaw	12
Prince Albert	12
North Battleford	12
Yorkton	8
Lloydminster	4
Melfort	4
Weyburn	4
Melville	4
Estevan	4
--	--
Total Sites	96

2.3.2 Sampling to Obtain Sites

Within each town or city, a list was made of all roads which were considered by local experts to carry a reasonable volume of traffic, during the proposed hours of the survey. Where a road was very long, or its character varied (speed limit, traffic density) the road was split into "segments". A list was made of all these roads and segments, and a random sample was made of this list.

The person selecting the sites would drive along each road segment and stop at each site which could meet the site criteria. Usually, there was only one truly excellent site on a segment. Where there was more than one excellent site on a

segment, a list was made of these sites and the site for the survey was chosen from a table of random numbers.

Not surprisingly, many of the sites used in 1981 were re-used in 1987.

2.3.3 Sampling at a Site

Vehicles were sampled in an unbiased manner. This was done by having the interviewer signal to the police whenever (s)he was ready for another interview. The police would then pull over the first vehicle that they could safely stop.

2.4 Criteria for Site Cancellation/Postponement

If a site was cancelled on a particular night, it was repeated at a later date. This was actually a postponement. The two major reasons for postponement were:

Inclement Weather: Rain, snow, fog, or any condition which significantly reduced the friction of the road surface or which reduced visibility.

Police absence: Police presence at the sites was considered essential for safety. If the police were later than 30 minutes, or were called away, the site was cancelled for that night and repeated at a later date.

3. Personnel and Responsibilities

3.1 Co-ordinating Committee

The survey was planned and co-ordinated by a committee comprised of representatives from the SaskAuto, Saskatchewan Highway Traffic Board, Saskatchewan Justice, and Saskatchewan Highways and Transportation.

Other agencies were invited to the committee, as required. These included: Transport Canada, some Police Departments, University of Saskatchewan Transportation Centre, Saskatchewan Alcohol and Drug Abuse Commission, R.C.M.P. Forensic Laboratory, Alcohol Countermeasure Systems, Inc. and, Heatt and Associates Inc.

The Survey was financed and managed by Traffic Safety Services personnel from SaskAuto.

3.2 Police

Wherever there was a site, the police force that had jurisdiction in that area took part in the survey.

The representative from Saskatchewan Justice acted as liaison with all police forces.

The Police were primarily responsible for ensuring the safety of the site - for randomly selecting vehicles from the traffic flow and for directing selected vehicles into the site. The secondary role of the Police was to be available as backup to the interviewers, should they have problems with motorists, or should an impaired motorist leave the site.

The active co-operation of all police forces made for a safe and successful survey.

3.3 Crew Chiefs

The field operations were directly controlled by two crew chiefs hired specially for the survey. Each crew chief was a retired policeman, and so knew his way around both police procedure and traffic-related activities.

The crew chiefs also selected the sites, prior to the survey.

Crew chiefs were responsible for managing the survey crews, confirming the availability of sites, confirming timing with police, and acting as a second stage of persuasion for drivers whose BAC was over the legal limit.

3.4 Survey Crews

One crew was based in Saskatoon and surveyed the north of the province. The other crew was based in Regina and dealt with the southern half of the province.

Each crew was made up of eight people. This consisted of six interviewers (divided into teams of three), and two traffic counters. The traffic counters were local people from each town, who made a count of the passing traffic, and helped with set-up and taking-down of sites. (Traffic count is an essential part of the weighting procedure - see Appendix A: Weighting the Data.)

The interviewers were responsible for organizing the site and conducting the interviews. In addition, individual crew members were responsible for charging and calibrating the breath-test equipment, implementing a data-quality procedure, and ensuring that the vehicles and equipment were available and working at the survey times.

3.5 Contractors

The Transportation Centre of the University of Saskatchewan managed the entire survey.

They hired the crew chiefs, the crew and the traffic counters. They acquired or built all of the equipment and obtained rental vehicles.

They provided space for training of all personnel, helped with form development, monitored the survey, produced weekly summary reports and provided an extra level of data quality control.

3.6 Media Liaison

An important part of the survey is to let the public know what is happening, and enlist their support and co-operation with the survey.

The media liaison person within Saskatchewan Government Insurance developed and issued a press release, and dealt with all media inquiries. The liaison was well done, and the media and public were supportive of the survey.

3.7 Federal Government (Transport Canada)

Transport Canada provided technical expertise and some equipment costs. These included: personnel to liaise with Saskatchewan and oversee the consultants; personnel for, and all costs associated with, the development of the sampling plan and of data preparation and analysis; printing of the questionnaires; and, all breath-test equipment.

In addition, Transport Canada provided consultants to help with the survey. Hieatt & Associates Inc. assisted with the overall application of the survey design, carried out crew and site-selection training, and monitored the data quality. Alcohol Countermeasures Systems Inc. provided the breath-test equipment and the training in the use of that equipment.

4. Survey Equipment and Forms

4.1 Breath-Test Instruments

The equipment used was the A.L.E.R.T. breath test apparatus. This is a type of "Roadside Screening Device", similar to the ones used by the police at the roadside.

The particular model chosen was the J4 digital A.L.E.R.T. This is the newest model, is smaller than the ones used by the police, and is somewhat more accurate. It provides a three-digit readout, so that the interviewer was able to produce a number which corresponded to the driver's blood alcohol concentration (BAC) in milligrams percent (mg%).

At the time of the survey, the J4 was not an "approved Roadside Screening Device", which means that it did not have the legal stamp of approval for evidence. This is true of all devices with digital output and is a definite advantage for the survey, since it nicely avoided any situations which could have arisen from the BAC being requested for judicial evidence.

The J4's were plugged into a portable battery pack, which extended the life of the unit's batteries under prolonged and comparatively low temperature conditions. The J4's and the battery packs were charged daily.

The calibration of each J4 was checked daily, using an alcohol simulator and the standard solutions intended to give readings of 100 mg %. If the units did not give readings between 95 and 105, they were recalibrated.

4.2 Site Reports

As part of site selection, a Site Report (see Appendix B) was completed. This provided details of the location of the site and information ranging from lighting, surface and location of the nearest phone, to the name and telephone of the site owner and the status of permission to use the site.

4.3 Interview Form (Questionnaire)

The interview form (see Appendix C) was reasonably simple and straight-forward and could be completed in one and a half to two minutes where the driver's BAC was under 60 mg %. (Where drivers' BAC's were over 60 mg %, extra time was required for repeated tests or to make alternative transportation arrangements.)

The responses to the questions were all anonymous, since no unique information about the driver or the driver's vehicle was recorded.

The information recorded on the interview form which was obtained by observation was the:

- site number,
- date,
- night of week,
- interviewer number,
- interview sequence number (e.g. the 5th interview at that site),
- number of the A.L.E.R.T. being used,
- time period of the interview,
- vehicle type,
- province issuing the vehicle licence plate
- gender of the driver,
- driver seat belt use
- number of occupants,
- outcome (what happened to the driver) where BAC readings were 60 mg or more, and,
- outcome of refusals (when drivers refused to take part in the survey).

The information recorded on the interview form which was obtained by asking the driver questions was the:

- origin (the type of place the driver started his/her trip from - e.g. home, restaurant),
- length of trip,
- driver's age (by single years from 15 to 24 and, in five or 10-year brackets thereafter),

- subjective probability of apprehension, (Question: If there were 100 legally impaired drivers on the roads in Saskatchewan tonight, how many do you think would be stopped by the police?),
- estimated number of alcoholic drinks consumed within the last seven days,
- time since last drink (for drivers with a BAC greater than 20 mg%),
- BAC reading (from the A.L.E.R.T.),
- estimation if over the legal limit (for drivers with a BAC greater than 20 mg%),
- location where the driver did most of his/her drinking that night (for drivers with a BAC over 20 mg%),
- attempted discouragement of the drinking driver (Question: - Did anyone try to discourage you from driving tonight? - for drivers with a BAC over 20 mg%),
- use of a designated driver, (Combined question where there was more than one adult occupant and where the driver's BAC was over 20 mg%)
 - Part 1. Has anyone else in the vehicle consumed alcohol this evening?
 - Part 2 (if the answer to Part 1 was "Yes") Did this determine who drove home tonight?),
- attendance at a DWI (Driving Without Impairment) course,
- suspension of driving licence for impaired driving,
- reason for refusing the interview (if the interview was refused), and,
- reason for refusing to provide a BAC sample (where the provision of a breath sample was refused).

4.4 Site Summaries

A site summary form (see Appendix D) was attached to each set of interviews for a site.

The primary purpose of this form was to provide a location to record site-specific information, such as the site description, traffic count, and the names of police officers, so that these could be linked with the individual interviews.

The secondary purpose of the site summary form was to permit ongoing data and procedural quality checks by providing a hand-count on refusal rates, and outcomes of refusals and over-60 mgs.

Finally, manual counts were made of the BAC ranges, together with the numbers of vehicles selected, drivers interviewed, and drivers providing breath samples. This provided ongoing information for those monitoring the survey, and was used as a check against the numbers in the computer analysis, to make sure that none of the data being sent for computer processing were lost.

5. General Procedures

The general procedures were the same as those used in previous surveys. The safety of the motoring public, the police and the interviewers was the number one concern. No accidents or injuries of any kind occurred.

Sites were preceded by signs; police cruisers used their flashing lights in higher-speed areas; and all personnel wore reflective vests and carried flashlights with orange wands, for increased visibility.

At the site itself, cones were used to mark lanes, some with reflectorized collars, and supplementary lighting was provided where necessary. Within the site, safety lanes of cones were built to increase interviewer safety. Careful consideration was given during the site setup to the flow of vehicles, both onto and off the site, and for parking and movement within the site.

The general procedure for an interview was as follows:

- The interviewer began the procedure by signaling to the police that (s)he was ready for another interview.
- The police then directed the first approaching vehicle that they could safely stop into the site. (Unless the motorist got confused, the police did not talk to the driver).
- Once the vehicle was on the site, the interviewer directed the motorist into the appropriate interview stall and requested participation as follows:
"(Good evening Sir/Madam), the University of Saskatchewan is conducting a voluntary survey on night-time driving. All information you give is confidential. You are under no obligation to participate, but we would appreciate it if you would assist us with this survey. Is that all right?"
- The driver either accepted or declined. If (s)he accepted, then the interviewer proceeded through the interview until (s)he reached the point of asking for a breath sample. Sometimes, at this point, drivers declined to continue. If, as was usual, they provided a sample, and if the sample read under 60 mg %, then the interview was completed and the driver was thanked and proceeded on his or her way.
- If the driver's BAC was only slightly above 60 mg %, for example 65-70 mg%, then (s)he could either make alternative travel arrangements, or wait a while and provide another sample. Since alcohol metabolizes at about 15 mg% per hour, there was a good chance that after waiting 20 -30 minutes, the BAC would drop below 60 mg% so that the driver could be permitted to drive from the site. However, there was a 50/50 chance that the alcohol was being absorbed *into* the system, rather than leaving it (being metabolised), so there was also the possibility that the BAC would rise. In this case, alternative transportation was found.

- If the driver's BAC was over 70 mg%, then the interviewer immediately tried to arrange for alternate transportation for the driver. The simplest method of alternative transportation way was to have a passenger (whose BAC is less than 60 mg %) drive the vehicle. Other approaches were: calling for a ride, calling a taxi, or walking. In exceptional circumstances, the crew chief or police would provide the transport.
- If the driver had a BAC over 60 mg% and wanted to drive away, then the interviewer tried to talk the driver out of that proposed action. If this proved difficult, then the interviewer handed the driver over to the crew chief who carried on with the persuasion. If this was not working, then the police were called over. Rarely, did the police officer actually reach the vehicle before the driver decided to go along with the required procedure.
- On the rare occasion where the driver parked the vehicle, sat in it for a while, then drove away, without getting permission to do so, then the police would pursue and stop that driver and persuade him or her to get home using alternative transportation.

It is a credit to the patience of the police that no driver was charged as a result of having participated in the survey, even if they were caught leaving their sanctuary (the site). This superb police co-operation meant that it was possible to conduct a truly voluntary survey. It is this co-operation that ensured such a high acceptance rate, with correspondingly meaningful data.

6. How to Read the Data - What it All Means

6.1 What the Numbers Mean

The numbers in the tables are percentages. They represent the best estimate for the night-time driving population of Saskatchewan that could be obtained. However, they were obtained from a sample, and confidence in their precision will vary from number to number. By expressing confidence as a range around the number, and by saying how confident one can be that the number generated falls within this range, it is possible to get a feel for how "good" the number is. This degree of confidence, or confidence interval, is shown in brackets. See below for an explanation.

6.2 What the Numbers in Brackets Mean

The numbers in brackets represent the confidence interval, that is the **Interval** around the number within which one can be confident the real estimate lies. For example, from Table 2, "Vehicles Sampled by Night of Week", the number for Wednesday is 16.8 (0.1). This means that 16.8 percent of all vehicles were sampled on Wednesday. If the number in brackets is taken as the range on either side of the percentage, an interval can be calculated within which one can be reasonably sure the real estimate falls. In this case the confidence interval is

16.8 plus or minus 0.1, that is, between 16.7 and 16.9. This small degree of imprecision looks good, but the confidence interval will not always be so narrow.

Inspection of the top left number in Table 17 "Where Drinking", reveals that the number is 6.2(4.6). This means that 6.2, plus or minus 4.6 percent of all those in the 21-59 BAC range do most of their drinking in the vehicle. This time, the estimate is less precise. What the numbers show is that one can be reasonably sure that between 1.6 and 10.8 percent of all those in the 21-59 BAC range did most of their drinking in the vehicle. If one were going to base a countermeasure programme on the data in this report, then it makes good sense to look at the confidence intervals and take them into account.

How confident can one be of these intervals? What is meant by "reasonably sure"? All numbers reported in brackets are the 95% confidence interval. This means, that if the survey were to be done 20 times, then the estimate will fall in the interval 19 times out of 20. That is, the bet is 19:1 that the real estimate falls within the confidence interval. (In technical terms, the 95% confidence interval is 1.96 times the standard error.)

Confidence intervals will generally widen when the data is divided into more categories. In the case of "Vehicles Sampled by Night of Week" (see Table 2), there were only four categories, whereas in the "Where Drinking" analysis (Table 17), there were 21 categories. Confidence intervals can be narrowed by increasing the sample size, which requires more time and more resources. For the interpretation of this survey, the sample size is set, so the recommended approach is to take the confidence intervals into account when using the data.

6.3 The Survey Design

A key element in understanding the survey design is to appreciate that it is critical to weight the data. Only by weighting the data can an accurate estimate of Saskatchewan night-time driving be provided. Further, weighting the data will permit accurate comparison of one survey with another. For this survey (and the 1981 survey), the data have all been weighted. For a detailed explanation of the design and of the weighting procedure, see Appendix A.

The fact that virtually all the data in this report are weighted has important consequences for use of the data. It is totally unacceptable to average or collapse rows (or columns which do not add to 100%) and expect the resulting numbers to be accurate.

It is acceptable to add, for example, the percentages for BAC's 60-80 mg% to those 81mg & over, (since these numbers are in a column that adds to 100%). However, this can only be used as an estimate, that is, one without confidence intervals. If confidence intervals are averaged, the results will be nonsense. To find confidence intervals which reflect new categories requires that new weights be assigned. This requires Transport Canada to perform another computer run.

7. Results of Single Variable Analyses

7.1 Vehicle Information

7.1.1 Vehicles Sampled by Night of Week

Table 2. Vehicles Sampled by Night of Week

Night	Wtd % of Vehicles
Wednesday	16.8 (0.1)
Thursday	27.8 (0.1)
Friday	27.9 (0.1)
Saturday	27.5 (0.2)
	100.0%

For convenience "Night", refers to the night the Survey started. For example, Wednesday night is from 9:00 p.m. Wednesday until 3:00 a.m. Thursday morning.

Fewer vehicles were sampled on Wednesday night than the other three nights, possibly because there were fewer passing vehicles to select from and therefore the interviewers were not working to capacity.

7.1.2 Vehicles Sampled by Time of Night

Table 3. Vehicles Sampled by Time of Night

Time	Wtd % of Vehicles
9:00 - 10:29	42.1 (0.2)
10:30 - 11:59	31.1 (0.2)
12:00 - 1:29	14.4 (0.1)
1:30 - 3:00	12.4 (0.4)
	100.0%

When the traffic volumes were high, vehicles selected from passing traffic represented a small sample of the passing traffic. Interviewers processed the vehicles as quickly as they could. However, as the time of night grew later, fewer vehicles passed the survey site when the interviewers were ready, and therefore the sample size decreased with later hours.

7.1.3 Vehicle Types

Table 4. Vehicle Types

Veh. Type	Wtd % of Vehicles
Cars	78.3(1.7)
Half-tons	16.5(0.8)
Vans	3.7(0.6)
Motorcycles	1.5(0.6)
	100.0%

The sample consisted almost entirely of cars and half-tons.

7.1.4 Licence Plates

Table 5. Licence Plates

Plates	Wtd % of Vehicles
Saskatchewan	96.0(1.1)
Other Provinces	3.7(1.0)
United States	0.3(0.2)
	100.0%

For all intents and purposes, the sample is one of Saskatchewan drivers.

7.2 Driver and Passenger Information

7.2.1 Drivers Interviewed

Of the 4,077 drivers selected for interviews, 78 drivers (about 1.9%) declined to take part. This meant that 3,999 accepted the interview, which brought the initial acceptance rate to 98.1%. However, a further 169 drivers (another 4.1% approximately) either were unable to provide a satisfactory breath sample, or refused at the point of being asked for a breath sample, reducing the total number of completed interviews to 3,830. The total acceptance rate for completed interviews (when rounded to one decimal place) was 93.9%

7.2.2 Driver Gender

Table 6. Driver Gender

Gender	Wtd % of Drivers
Female	25.1(1.3)
Male	74.9(1.3)
	100.0%

About a quarter of all drivers were female and three quarters were male. As just over half of the licensed drivers are male (53%), this means that males are over-represented in the night-time driver population by a factor of about 1.5.

7.2.3 Driver Seat Belt Use

Table 7. Driver Seat Belt Use

Seat Belt Use	Wtd % of Drivers
Not in Use	21.7(1.1)
Lap & Shoulder	70.4(2.1)
Lap Only	7.0(1.8)
Not Fitted	0.9(0.8)
	100.0%

Approximately three quarters of all drivers were wearing their seat belts.

7.2.4 Number of Vehicle Occupants

Table 8. Number of Vehicle Occupants

# Occupants	Wtd % of Vehicles
1 occupant	39.2(0.9)
2 occupants	39.0(3.3)
3 occupants	11.8(0.8)
4 plus occupants	10.0(3.7)
	100.0%

Approximately 80% of all vehicles have only one or two occupants.

7.3 Driver and Passenger Responses to Questions

(Asked of all Drivers)

7.3.1 Origin of Journey

Table 9. Origin of Journey

Origin	Wtd % of Drivers
Own Home	25.8(1.1)
Friend/Relatives' Home	19.3(1.7)
Work	11.3(1.1)
Restaurant	14.5(1.3)
Bar/Club/Tavern	6.8(0.8)
Recreation	12.6(1.4)
Shopping/meeting	7.7(1.0)
Other	2.0(0.3)
	100.0%

The question was: "what kind of place are you coming from tonight?" Almost half of all drivers were coming from home, or the home of a relative or friend. Only a small number (6.8%) report coming from what is primarily a drinking establishment (bar/club/tavern).

7.3.2 Length of Trip

Table 10. Length of Trip

Trip Length	Wtd % of Drivers
1 - 5 km	52.1(3.2)
6 - 10 km	14.6(1.8)
11 - 20 km	8.7(1.2)
21 - 50 km	11.3(1.8)
51 - 100 km	6.3(1.2)
Over 100 km	7.0(0.6)
	100.0%

A "trip" is defined as being from the time the driver last got into the vehicle, until (s)he next leaves the vehicle. Two thirds of all drivers interviewed were on short trips - less than 10 km.

7.3.3 Age of All Drivers

Table 11. Age of All Drivers

Age Group	Wtd % of Drivers
15 - 24	42.8(1.1)
25 - 39	36.2(0.6)
40 - 59	16.9(1.8)
61 and over	4.1(0.9)
	100.0%

While young drivers (15-24) comprise slightly over 20% of the driving population, they represent over 40% of the drivers on the road at night. Thus they are twice as exposed during this high-risk driving time as would be expected from a simple examination of their contribution to the driving population as a whole. Based upon these numbers, it is not surprising that young drivers are involved in night-time driving accidents.

A detailed breakdown of the relative exposure for different ages is shown in Table 13.

7.3.4 Drivers in the 15-24 Age Group

Table 12. Drivers in the 15-24 Age Group

Age	Wtd % of Drivers
15	0.1
16	3.4
17	3.9
18	6.1
19	5.7
20	5.1
21	4.8
22	4.8
23	4.5
24	4.0
(25 and over)	(57.4)

These data show that very few 15 year-olds are driving at night. Drivers of 16 and 17 years-old are more frequently on the roads, but it is 18 and 19 year-olds who represent the biggest proportion of drivers for any age group. From 20 year-olds to 24 year-olds, there is a gradual decline of the proportion of drivers on the roads at night.

7.3.5 Relative Exposure for Different Age Groups

Table 13. Relative Exposure for Different Age Groups

Age	% On Road	% Licensed	Ratio: On Road/ Licensed
15	0.1	0.1	1.0
16	3.4	1.8	1.9
17	3.9	2.0	2.0
18	6.1	3.0	2.0
19	5.7	2.8	2.0
20	5.1	2.5	2.0
21	4.8	2.3	2.0
22	4.8	2.1	2.3
23	4.5	1.8	2.5
24	4.0	1.6	2.5
25 - 39	36.2	35.2	1.0
40 - 59	16.9	26.4	0.6
60 and over	4.1	17.9	0.2

Most of these data were originally presented with two decimal points. These have been corrected to one decimal point, so that the numbers do not add up to exactly 100%.

Inspection of the third column - Ratio of drivers on the road at night, to drivers licensed - shows that from 16 through 21 years, drivers are over-represented on the roads by a factor of two. This over-representation on the roads increases up to a factor of 2.5 for 23 to 25 year-olds, then drops to one for 25 to 39 year olds, then to less than one for older drivers.

These data show that young drivers are greatly over-represented at night, and that as drivers become older, they become progressively under-represented at night. What this means is that the exposure to risk of a night-time driving accident is much higher for young drivers than it is for older drivers.

7.3.6 Drivers' Estimates of Police Stopping Impaired Drivers

Table 14. Estimates of Police Activity

Out of 100	Wtd % of Drivers
None	6.2(1.2)
1 - 2	27.8(0.8)
3	6.1(0.5)
4 - 7	20.5(2.0)
8 - 15	18.0(0.7)
16 - 100	21.4(1.1)
	100.0%

The question asked was - "If there were 100 legally impaired drivers on the roads in Saskatchewan tonight, how many do you think would be stopped by the police for impaired driving?"

Based on Night-Time Driver Survey data from 1979 and 1981, together with exposure data and police charges, Lawson (1983) calculated that police stop drivers in Canada on one in every 514 impaired trips. So the best estimate of the actual probability of being stopped by the Police for impaired driving is less than one time in 100 (about 0.2 drivers out of 100, using the 1979-1983 figures).

While the question is worded to get at the number out of 100 (for simplicity and understandability), most of the population have no idea, and guess. About one third are in the ballpark (0 and 1-2); the rest overestimate, some quite substantially. From an enforcement point of view it can be argued that if people over-estimate the probability of being stopped then they are less likely to drive after drinking.

7.3.7 Number of Drinks in the Last Seven Days

Table 15. Number of Drinks in the Last Seven Days

Number of Drinks	Wtd % of Drivers
0 - 1	45.3(1.5)
2 - 3	14.6(0.6)
4 - 7	16.1(0.7)
8 - 11	6.1(1.6)
12 - 15	6.4(2.0)
16 - 77	11.5(0.9)
	100.0%

These data suggest that about three quarters of the population have, on average, one drink a day or less. These data fit in with the BAC data. See Table 16, below.

8. Questions Asked To Drivers With BAC's 21 mg % and Over

These numbers deal only with those drivers who showed a positive BAC (21 mgs% and over), which represents only 14.7% (0.7) of the contribution to the provincial data and were drawn from a sample size of 599 records. The percentages referred to are percentages of those in this group of 599 drivers, rather than to the 3830 drivers in the survey as a whole. It should be noted that all percentages from this point on are weighted percentages of drivers.

8.1 Reading This Set of Tables

The tables have been aligned to make them easier to read. Read down each column to look at the distribution within each alcohol group. The comparison that is most frequently relevant is across the rows - across the horizontal.

In this section of the data, an attempt is made to answer the question - "How do the groups at different BAC levels differ from each other?"

8.1.1 Question: Do you think you are over the legal limit?

Table 16. Think You Are Over the Legal Limit

BAC Range (mg%):	21-59	60-80	81 & Over
Yes	10.6(1.6)	25.5(15.1)	38.1(15.4)
No	89.1(1.8)	69.0(17.7)	61.9(15.4)
	<u>99.7%</u>	<u>94.5%</u>	<u>100.0%</u>

These data do not add up to exactly 100%, as there was an extra "don't know" category included in the calculation. However, the numbers show that as BAC increases, the number of drivers who think they are over the legal limit increases. The most spectacular finding is that over 60% of those who are over the (81 & over) legal limit do not recognize this fact. It would seem that there is room for some education in this regard.

8.1.2 Question: Where did you do most of your drinking tonight?

Table 17. Where Drinking

BAC Range (mg%):	21-59	60-80	81 & Over
In the Vehicle	6.2(4.6)	7.5(15.1)	3.2(3.4)
Own Home	11.1(4.6)	9.4(5.4)	16.1(4.4)
Friend/Relative	21.6(3.3)	16.5(8.5)	19.2(7.5)
Restaurant	9.0(8.2)	9.8(11.1)	1.9(1.7)
Bar or Tavern	36.4(9.3)	38.6(6.4)	50.4(9.3)
Special Licence	6.5(4.3)	8.6(7.4)	5.7(1.7)
Other	9.2(2.9)	9.6(10.1)	3.5(3.9)
	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>

Obviously, people who go to drinking establishments drink alcohol. Between one third and half of all drinking drivers came from bars or taverns. Half of all drivers with BACs 81 & over came from bars or taverns. A further quarter to one third drank either at home or at a friends' or relatives' home.

8.1.3 Question: Did anyone try to discourage you from driving tonight?

Table 18. Anyone Discourage you from Driving

BAC Range (mg%):	21-59	60-80	81 & Over
Yes	5.0(2.7)	0.2(0.4)	9.3(4.9)
No	95.0(2.7)	99.8(0.4)	90.7(4.9)
	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>

The numbers of drivers reporting that someone attempted to discourage them from driving are very small. It would seem that the practice of discouraging impaired persons from driving is just beginning to happen in Saskatchewan. Someone had unsuccessfully attempted to discourage almost one in 10 of the drivers whose BAC exceeded 80 mg %. It is, however, likely that other attempts to discourage drivers were successful. Successful attempts would not show on this survey.

8.1.4 Question: Has anyone in the vehicle consumed alcohol tonight?
(Given that BAC was 21 or more, and there was more than one occupant of driving age).

Table 19. Did Alcohol Consumption Determine Who Drove

BAC Range (mg%):	21-59	60-80	81 & Over
Yes	38.4(79.9)	29.3(81.2)	34.5(70.2)
No	61.6(79.7)	70.7(81.2)	65.5(70.2)
	<u>100.0%</u>	<u>100.0%</u>	<u>100.0%</u>

These data are reported here for completeness only. The sample size was so small that it led to enormous confidence intervals. For example, for "81 & over" 34.5% plus or minus 70.2 answered Yes (between - 35.7 and + 104.7, whereas 65.5% plus or minus 70.2 answered No (between - 4.7 and + 135.7).

With confidence intervals this size it is meaningless to suggest that there are any observable differences in the data.

9. Alcohol-Related Information - Legal BACs

As in the report of the 1981 survey, the alcohol data will be organized in two ways.

The first way is according to what is legal in Saskatchewan and what is known about the effects of alcohol. This should be useful for most data needs relating to driving after drinking. A Police Officer "legally" suspend a driver's licence for 24 hours if his or her BAC is equal to or greater than 60 mg%. If the driver's BAC is over 80 mg% (i.e. 81 or over) the driver can be charged under the Criminal Code of Canada with having a BAC in excess of 80 mg per 100 millilitres (80 mg%).

The second way to organize alcohol data relates to Saskatchewan's pre-set calibrations of the A.L.E.R.T. Roadside Screening Device, and is useful to Police and those concerned with dealing with current Police practices. The A.L.E.R.T.s are calibrated to read from 0 to 59 mg% (safe), from 60 to 99 mg% (warn, or 24 hour suspension) and 100 mg% and over (fail, leading to a charge).

The Legal BAC's will be reported in this section. The Police BAC's will be reported in Section 10.

9.1 "Legal" A.L.E.R.T. Distributions

The "legal" distribution is as follows:

0 - 20 mg%	No alcohol (or a trace)
21 - 59 mg%	Some alcohol (traditionally not enough to cause significant impairment). Impairment would be significant if alcohol at this level is combined with drugs, fatigue or inexperience in drinking.
60 -80 mg%	Alcohol at a concentration that can impair. In Saskatchewan, the driver may have his or her licence suspended for 24 hours.
81 mg% or more	Over the legal limit under the Criminal Code of Canada.

The weighted estimate of Saskatchewan's drivers is as follows:

9.2 "Legal" BACs

9.2.1 BAC Distributions According to "Legal" Ranges

Table 20. BAC Distribution According to "Legal" Ranges

BAC of Drivers (mg%)	Wtd % of Drivers
0 - 20	85.3 (0.7)
21 - 59	9.0 (1.1)
60 - 80	2.1 (0.3)
81 & over	3.6 (0.4)
	100.0%

This table indicates that between the hours of 9:00 p.m. and 3:00 a.m. on Wednesday, Thursday, Friday and Saturday nights, the best estimate of Saskatchewan's driving population revealed:

- 3.6% of drivers, or one driver in 28, had a BAC in excess of 80 mg% and could, theoretically, have received a charge for having a BAC in excess of 80 mg%.
- 2.1% of drivers, or one driver in 47, had a BAC between 60 and 80 mg% and could, theoretically, have received a 24 hour suspension.
- 5.7% of drivers, or one driver in 18, had a BAC of 60 mg%, or over the level legally recognized by Saskatchewan as producing driving impairment.
- 9.0% of drivers, or one driver in 11, had a BAC between 21 and 59 mg% and so had been drinking, but not to the legal impairment limits.
- 14.7% of drivers, or one driver in seven, had been drinking.
- 85.3% of drivers had no alcohol in their bodies when driving.

9.2.2 "Legal" BAC, by Week-Night

Table 21. "Legal" BAC, by Week-Night

Week-night:	Wednesday	Thursday	Friday	Saturday
BAC Range (mg%)				
0 - 20	86.5(2.0)	90.9(2.2)	79.5(0.6)	84.6(3.8)
21 - 59	7.8(1.6)	5.3(0.9)	12.3(1.0)	10.3(3.1)
60 - 80	2.5(0.8)	1.2(0.5)	2.4(0.8)	2.4(1.0)
81 & over	3.2(1.7)	2.6(1.5)	5.8(0.8)	2.7(1.7)
All Drivers	16.8(0.1)	27.8(0.1)	27.9(0.1)	27.5(0.2)

The figure that stands out from this table is the Friday night heavy drinking. Almost twice as many drivers were in the "81 & over" category as any other night.

9.2.3 "Legal" BAC, by Time of Night

Table 22. "Legal" BAC, by Time of Night

Time:	9:00-10:29	10:30-11:59	12:00-1:29	1:30-3:00
BAC Range (mg%)				
0 - 20	92.5(0.5)	87.9(1.1)	79.3(1.7)	60.4(4.2)
21 - 59	5.2(1.3)	7.9(1.0)	12.8(2.1)	20.8(1.5)
60 - 80	1.0(0.2)	2.2(0.7)	3.2(1.6)	4.4(4.3)
81 & over	1.3(0.9)	2.0(0.6)	4.7(0.9)	14.4(2.0)
All Drivers	42.1(0.2)	31.1(0.2)	14.4(0.1)	12.4(0.4)

To build up high levels of BAC, it is necessary to imbibe at a rate faster than the alcohol can be metabolised. Given such a rate of drinking over prolonged periods, it is not surprising that impairment increases with time of night.

Between 1:30 and 3:00 a.m., 18.8% of drivers, or one driver in five, had a BAC in excess of Saskatchewan's legal limit. Of these, about one in 20 drivers have BACs between 60 & 80 mg% and a further one in seven have BACs in excess of 80 mg%.

9.2.4 "Legal" BAC, by Vehicle Type

Table 23. "Legal" BAC, by Vehicle Type

Vehicle Type:	Cars	Half-Tons	Vans	Motorcycles
BAC Range (mg%)				
0 - 20	86.0(1.3)	81.3(3.2)	87.7(7.1)	83.1(14.4)
21 - 59	8.6(1.5)	11.8(2.0)	7.6(3.6)	5.2(3.0)
60 - 80	1.9(0.3)	2.4(1.1)	3.2(5.0)	8.9(16.7)
81 & over	3.5(0.5)	4.5(2.5)	1.5(1.9)	2.8(5.9)
All Drivers	78.3(1.7)	16.5(0.8)	3.7(0.6)	1.5(0.6)

For Motorcycles, the confidence intervals are too wide to be meaningful - because the total number of motorcyclists sampled was very small (1.5% of all drivers). The same is true for van drivers.

9.2.5 "Legal" BAC, by Driver Gender

Table 24. "Legal" BAC, by Driver Gender

Gender:	Female	Male
BAC Range (mg%)		
0 - 20	87.4(1.1)	84.5(0.8)
21 - 59	8.4(2.0)	9.3(1.3)
60 - 80	1.4(1.0)	2.3(0.5)
81 & over	2.8(0.5)	3.9(0.9)
All Drivers	25.1(1.3)	74.9(1.3)

While almost the same proportion of females as males had been drinking a little (21 to 59 mg%), considerably fewer females had BACs in the 60 to 80 mg% range. Although females with BACs of 81 mg% and over are proportionately fewer than males, they are still almost as bad as males in this regard. It would appear that, if females drive, the chances of them being grossly impaired are beginning to approach those of males.

9.2.6 "Legal" BAC, by Seat Belt Use

Table 25. "Legal" BAC, by Seat Belt Use

Seat Belt Use:	Not Wearing	Wearing
BAC Range (mg%)		
0 - 20	19.1(1.2)	80.9(1.2)
21 - 59	30.4(9.2)	69.6(9.2)
60 - 80	35.6(7.4)	64.4(3.9)
81 & over	45.2(13.5)	54.8(6.9)
All Drivers	21.7(1.1)	78.3(2.0)

The estimates of seat belt use show a steady decline in wearing rate with as the BAC increases. However, with the large confidence interval for the "81 & over" group it would be imprudent to suggest that this group are dramatically worse than the "60 - 80" group.

What is clear, is that drinking drivers wear their seat belts less than sober drivers. Reduced seat wearing may well contribute to the high severity of injury associated with alcohol-related accidents.

9.2.7 "Legal" BAC, by Vehicle Occupants

Table 26. "Legal" BAC, by Vehicle Occupants

No. of Occupants:	1	2	3	4
BAC Range (mg%)				
0 - 20	39.7(1.7)	38.7(3.4)	11.5(0.6)	10.1(3.8)
21 - 59	39.5(5.9)	38.0(3.2)	13.0(1.7)	9.5(5.0)
60 - 80	32.1(13.2)	39.5(13.0)	17.6(10.5)	10.8(4.6)
81 & over	30.2(9.0)	47.6(7.6)	12.5(5.3)	9.7(5.4)
All Drivers	39.2(0.9)	39.0(3.3)	11.8(0.8)	10.0(3.7)

There would seem to be little relationship between the number of vehicle occupants, and the degree of driver impairment.

9.2.8 "Legal" BAC, by Trip Origin

Table 27. "Legal" BAC, by Trip Origin

Trip Origin:	Home	Friends	Work	Restaurant
BAC Range (mg%)				
0 - 20	89.1(3.5)	83.7(2.1)	91.2(2.5)	89.3(1.3)
21 - 59	6.3(2.6)	10.2(3.0)	6.2(1.7)	7.8(1.1)
60 - 80	1.8(1.9)	2.1(2.1)	0.5(0.5)	1.0(0.7)
81 & over	2.8(0.9)	4.0(3.1)	2.1(2.0)	1.9(0.8)
All Drivers	25.8(1.1)	19.3(1.7)	11.3(1.1)	14.5(1.3)

Trip Origin	Bar/Tavern	Recreation	Shopping	Other
BAC Range (mg%)				
0 - 20	44.3(13.2)	87.6(3.1)	92.2(3.3)	94.1(9.1)
21 - 59	31.0(11.8)	8.4(3.3)	5.4(3.6)	1.6(2.8)
60 - 80	8.9(5.7)	1.9(1.0)	1.8(2.3)	3.0(6.3)
81 & over	15.8(9.7)	2.1(1.1)	0.6(0.6)	1.3(2.0)
All Drivers	6.8(0.8)	12.6(1.4)	7.7(1.0)	2.0(0.3)

Many more drivers coming from bars or taverns, have high BACs than drivers coming from other locations. More drivers coming from home, friends homes or from recreational activities have higher BACs than drivers coming from work, restaurants or shopping.

9.2.9 "Legal" BAC, by Trip Length

Table 28. "Legal" BAC, by Trip Length

Trip Length:	1 - 5 km	6 - 10 km	11 - 20 km
BAC Range (mg%)			
0 - 20	83.8(1.1)	88.9(3.8)	84.8(2.6)
21 - 59	9.7(1.2)	7.7(4.6)	10.3(2.4)
60 - 80	2.3(0.9)	1.5(1.4)	1.1(1.0)
81 & over	4.2(1.1)	1.9(0.7)	3.8(2.5)
All Drivers	52.1(3.2)	14.6(1.8)	8.7(1.2)

Trip Length:	21 - 50 km	51 - 100 km	Over 100 km
BAC Range (mg%)			
0 - 20	81.9(3.4)	90.8(3.3)	94.0(2.1)
21 - 59	11.0(2.8)	6.8(3.0)	2.1(1.4)
60 - 80	3.9(0.8)	1.5(1.9)	0.7(1.2)
81 & over	3.2(1.0)	0.9(1.1)	3.2(2.8)
All Drivers	11.3(1.8)	6.3(1.2)	7.0(0.6)

One might expect impaired drivers to restrict the length of their trips. These data show no evidence in support of this contention.

9.2.10 "Legal" BAC, by Driver Age Group

Table 29. "Legal" BAC, by Driver Age Group

Age Groups:	15 - 24	25 - 39	40 - 59	60 +
BAC Range (mg%)				
0 - 20	84.7(1.1)	82.4(1.3)	91.1(2.3)	92.7(3.0)
21 - 59	9.0(1.9)	11.3(1.3)	5.0(2.6)	5.7(2.8)
60 - 80	2.5(0.4)	2.2(1.1)	1.3(0.9)	0.7(1.0)
81 & over	3.8(1.0)	4.1(0.8)	2.6(2.3)	0.9(1.4)
All Drivers	42.8(1.1)	36.2(0.6)	16.9(1.8)	4.1(0.9)

It would seem from these data that the traditional differences in drinking driving between the 15 to 24 year-old group and the 25 to 39 year-old is blurring. More of the younger group are in the higher BAC range.

9.2.11 "Legal" BAC, by Age, 15 - 24

Table 30. "Legal" BAC, by Age, 15 - 24

Age:	15	16	17	18
BAC Range (mg%)				
0 - 20	100.0(0.8)	97.0(2.2)	86.0(7.3)	88.0(2.4)
21 - 59	0.0(0.0)	2.1(1.7)	9.3(8.3)	5.5(1.9)
60 - 80	0.0(0.0)	0.0(0.0)	1.4(1.3)	3.4(4.3)
81 & over	0.0(0.0)	0.9(0.8)	3.3(3.2)	3.1(4.0)

Age:	19	20	21	22
BAC Range (mg%)				
0 - 20	81.9(4.8)	86.6(5.9)	85.6(4.7)	70.3(11.8)
21 - 59	6.3(1.6)	7.2(3.5)	9.0(4.9)	21.3(10.5)
60 - 80	5.8(6.7)	2.7(2.5)	2.9(1.5)	1.8(1.5)
81 & over	6.0(6.3)	3.5(2.1)	2.5(0.6)	6.6(3.2)

Age:	23	24	25 & Over
BAC Range (mg%)			
0 - 20	85.1(6.9)	84.7(11.1)	85.7(1.2)
21 - 59	8.8(3.6)	11.9(10.7)	9.0(0.6)
60 - 80	1.8(1.0)	0.5(0.8)	1.8(0.9)
81 & over	4.3(4.7)	2.9(1.5)	3.5(0.8)

It is clear from the data, that 15 and 16 year-olds drink and drive very little. Beyond that, it is difficult to say much about the other age groups if one considers the immense size of the confidence intervals. To properly interpret data in single-year age groups would require a much larger sample size than was obtained for this survey.

9.2.12 "Legal" BAC, by Number of Drinks in the Last Seven Days

Table 31. "Legal" BAC, by Number of Drinks in the Last Seven Days

Drinks in 7 days:	0 - 1	2 - 3	4 - 7
BAC Range (mg%)			
0 - 20	97.9(0.8)	83.2(4.1)	75.5(2.7)
21 - 59	1.7(0.8)	11.0(3.6)	16.4(3.2)
60 - 80	0.2(0.2)	2.4(2.3)	3.5(2.8)
81 & over	0.2(0.2)	3.4(1.8)	4.6(2.4)
All Drivers	45.3(1.5)	14.6(0.6)	16.1(0.7)

Drinks in 7 Days	8 - 11	12 - 15	16 - 77
BAC Range (mg%)			
0 - 20	66.5(7.0)	69.7(5.3)	69.3(6.2)
21 - 59	18.2(4.1)	17.0(3.3)	16.6(2.6)
60 - 80	6.8(3.2)	3.6(3.8)	4.1(1.0)
81 & over	8.5(1.9)	9.7(7.6)	10.0(6.5)
All Drivers:	6.1(1.6)	6.4(2.0)	11.5(0.9)

Drivers with higher BACs have had more drinks in the last seven days.

10. Police BAC's

10.1 "Police" BAC Distributions

The pre-set calibrations of the Roadside Screening Device used by the Police, and their implications are as follows:

Green Light (0 - 59 mg%)	Pass
Yellow Light (60 - 99 mg%)	Warn - 24 Hour Suspension
Red Light (100 mg% & over)	Fail. Go to the station for a Breathalyzer Test

This section looks at the data arranged as if a Police Roadside Screening Device was used.

The tables have been selected and arranged to provide information which might be of use to Police. The data can be used to answer the following questions:

- What is the extent of driving after drinking?
- When does drinking driving take place? (time of night, night of week, time on Friday nights).
- Where does the drinking take place, prior to driving? (origin of trip, location of alcohol consumption).
- What other factors might be used as predictors of impairment? (gender, age group, age of young drivers, seat belt use).

10.2 "Police" BACs

10.2.1 "Police" BAC Distribution of All Saskatchewan Drivers

Table 32. "Police" BAC Distribution of All Saskatchewan Drivers

BAC of Drivers (mg%)	Wtd. % of Drivers
0 - 59	94.5(0.3)
60 - 99	3.0(0.3)
100 & over	2.5(0.3)
	100.0%

From a carefully designed sample of the night-time driving population of Saskatchewan, breath tests given to randomly selected drivers (using the categories of the A.L.E.R.T. roadside screening device) produced the following results:

- Three percent of drivers, or one driver in 33, could have received a "warn" and had their licences suspended for 24 hours.
- 2.7 percent of drivers, or one driver in 37, could have been taken to the station for a breathalyzer test and could very likely have been charged for having a BAC in excess of 80 mg percent.
- 5.7 percent of drivers, or one driver in 18, could potentially have had some kind of action taken against them, to restrict their driving after drinking.

10.2.2 "Police" BAC, by Time of Night

Table 33. "Police" BAC, by Time of Night

Time:	9:00-10:29	10:30-11:59	12:00-1:29	1:30-3:00
BAC Range (mg%)				
0 - 59	97.8(1.0)	96.4(1.3)	92.1(1.9)	81.2(3.8)
60 - 99	1.5(0.8)	2.5(0.9)	4.9(1.9)	7.0(4.6)
100 & over	0.7(0.2)	1.1(0.6)	3.0(1.2)	11.8(1.7)
All Drivers	42.4(0.5)	31.3(0.5)	14.0(0.3)	12.3(0.3)

Given that it takes time for the BAC to build up and given that most people start drinking in the evening, it is to be expected that the percentages of impaired drivers increases as the hour gets later. While there are relatively few impaired drivers before midnight, between midnight and 1:30 am every 20th driver could receive a "warn" and every 33rd driver would "fail" the breath-test screening. Between 1:30 am and 3:00 am, every 14th driver could receive a "warn" and every eighth or ninth driver would "fail" the breath-test screening.

10.2.3 "Police" BAC, by Night of Week

Table 34. "Police" BAC, by Night of Week*

Night:	Wednesday	Thursday	Friday	Saturday
BAC Range (mg%)				
0 - 59	94.3(1.4)	96.4(1.3)	92.3(0.8)	94.9(2.5)
60 - 99	4.0(0.3)	2.2(0.3)	2.9(0.5)	3.3(0.8)
100 & over	1.7(0.7)	1.4(0.5)	4.8(0.7)	1.8(0.7)
All Drivers:	16.5(0.7)	28.1(1.0)	28.1(0.6)	27.3(0.2)

* For ease of recording we are calling the "night", the night on which the survey began. For example Wednesday "night" is from 9:00 p.m. Wednesday until 3:00 am Thursday morning.

What stands out from these data is that Friday is the night for excessive drinking, with one in twenty drivers having a BAC of over 100 mg%. On Wednesday and Saturday drivers are more likely to be in the 60-99 mg% (warn) range. Thursday, by comparison, is comparatively light for both the "warn" and the "fail" levels of the breath-test screening device.

10.2.4 "Police" BAC, by Time for Friday Nights

Table 35. "Police" BAC, by Time for Friday Nights

Time:	Friday:			
	9:00-10:30	10:30-12:00	12:00-1:30	1:30-3:00
BAC Range (mg%)				
0 - 59	96.6(1.1)	96.0(1.1)	91.9(2.6)	76.6(2.7)
60 - 99	1.6(0.6)	2.6(0.6)	4.2(2.4)	4.5(4.4)
100 & over	1.8(0.9)	1.4(0.9)	3.9(2.5)	17.9(6.3)
	100.0%	100.0%	100.0%	100.0%

When the data are broken down into 16 categories representing the four nights and the four times, the confidence intervals become very wide and we can have less certainty in the data. (See Section 6.2 for an explanation of confidence intervals.) However, since the effect for Friday nights and 1:30 to 3:00 is so dramatic, the above data are presented.

What this table shows, is that before midnight the extent of drinking driving is fairly "normal". However, from midnight to 1:30 every 12th driver could receive either a "warn" or a "fail" on the screening device (these split fairly evenly). From 1:30 to 3:00 am, every 22nd driver could receive a "warn", and every fifth or sixth driver could receive a "fail" on the roadside screening device.

10.2.5 "Police" BAC, by Origin of Trip

Table 36. "Police" BAC, by Origin of Trip

Origin:	Home	Friend	Work	Restaurant
BAC Range (mg%)				
0 -59	95.4(2.2)	93.9(3.0)	97.4(2.0)	97.1(1.0)
60 - 99	2.7(2.0)	3.0(2.1)	1.2(1.5)	1.1(0.7)
100 & over	1.9(0.4)	3.1(2.5)	1.4(0.9)	1.8(0.8)
All Drivers:	25.8(1.1)	19.3(1.7)	11.3(1.1)	14.5(1.3)

Origin:	Bar/Tavern	Recreation	Shopping	Other
BAC Range (mg%)				
0 -59	75.3(4.6)	96.0(0.9)	97.6(2.3)	95.7(6.5)
60 - 99	11.6(6.5)	3.4(1.1)	2.0(2.3)	3.0(6.3)
100 & over	13.1(10.3)	0.6(0.5)	0.4(0.6)	1.3(2.0)
All Drivers:	6.8(0.8)	12.6(1.4)	7.7(1.0)	2.0(0.3)

The question here was "what kind of place are you coming from tonight?" and was asked of every driver.

Not surprisingly, drivers coming from bars and taverns (places where people go specifically to drink) are the highest in BAC - 11.6%, or one in nine drivers could receive a "warn" and 13.1%, or one in seven could receive a "fail" on the Roadside Screening Device.

Drivers coming from friends' houses constitute the next highest group - one in 33 could receive a "warn" and a further one in 33 could receive a "fail" on the Roadside Screening Device.

Drivers coming from restaurants have very low BACs. Drivers coming from work have higher BACs than would be expected.

10.2.6 "Police" BAC, by Location of Alcohol Consumption

Table 37. "Police" BAC, by Location of Alcohol Consumption

Location:	In Vehicle	Own Home	Friend/Relative	Restaurant
BAC Range (mg%)				
0 -59	67.6(44.3)	56.6(15.8)	65.5(12.9)	74.7(21.7)
60 - 99	20.4(36.8)	24.0(15.9)	18.1(9.9)	20.7(23.3)
100 & over	12.0(19.7)	19.4(3.9)	16.4(5.6)	4.6(6.9)
All Drivers:	5.7(1.7)	12.0(3.6)	20.3(3.5)	7.4(5.2)

Location cont:	Bar/Tavern	Special Licence	Other
BAC Range (mg%)			
0 -59	55.9(6.5)	60.6(13.0)	72.0(22.0)
60 - 99	19.7(8.1)	27.5(9.5)	21.2(17.3)
100 & over	24.4(7.4)	11.9(13.0)	6.8(6.3)
All Drivers:	40.1(8.7)	6.6(4.0)	7.9(1.4)

The question "where did you do most of your drinking tonight?" was asked only of those whose BAC was 21 mg % or over (that is, those who had been drinking). This represents about 15% of the drivers surveyed.

This is a new question, and significantly changes the kind of inferences that might be made about where to look for drinking drivers. Table 36 shows that only 6.8% (or one in 15) drinking drivers report starting their trip in a bar or tavern. These numbers are so small that a case could be made for saying that even if all these drivers were removed from the road, there would still be 93.2% of the driving population to deal with. Table 37, however, tells a different story.

Table 37 shows that of the drivers who had been drinking, some 40% had done most of their drinking in a bar or tavern. Of these drivers about 20% could have received a "warn" and a further 24% a "fail".

What is needed is a table which shows the **percent of impaired drivers amongst all drinking drivers** on the road as a function of the location of alcohol consumption. Table 38 is such a derivation from Table 37.

10.2.7 Percent of Impaired Drivers amongst all Drinking Drivers as a Function of the Location of Alcohol Consumption

Table 38. Percent of Impaired Drivers amongst all Drinking Drivers as a Function of the Location of Alcohol Consumption

Location	BAC 60 - 99 % of D-Ds *	BAC 100 & Over % of D-Ds
Bar/ Tavern	7.9	9.6
Friends/Relatives Home	3.7	3.4
Own Home	2.9	2.3
Special Licence	1.8	0.8
Other	1.7	0.5
In Vehicle	1.2	0.7
Restaurant	1.5	0.3

* Drinking Drivers

Table 38 was derived from Table 37 by multiplying each weighted percentage in by the percentage of drivers in each impaired category. For example, the "Own Home" percent in the 69 - 99 BAC range by the "All Drivers" percentage. What the end numbers represent are the percentages of all drivers who had been drinking, coming from the various drinking locations.

There are no confidence intervals for this table and some of the confidence intervals from Table 37 are quite large. Therefore, the data do not have the precision of most of the other tables.

If, however, the rank order is used (from highest to lowest of the drinking locations) it can be seen that Bars and Taverns generate the most impaired drivers, followed by drinking in a friends' or relatives' home. Drinking in one's own home comes next, followed by special licence (for a function requiring a special liquor licence, like a wedding), and then drinking in the vehicle. Drinking to impairment in a restaurant is at the bottom of the list.

These data support the concern that Police have had about the driving that follows drinking in Bars and Taverns. The data could be used to target these drinking establishments as an area for activity. It should be noted that equipment for providing self-administered breath-tests in bars has just recently become available.

10.2.8 "Police" BAC, by Gender

Table 39. "Police" BAC, by Gender

Gender:	Female	Male
BAC Range (mg%)		
0 - 59	95.9(1.4)	93.8(0.6)
60 - 99	2.2(0.8)	3.2(0.6)
100 & over	1.9(1.0)	3.0(0.6)
	100.0%	100.0%

While only one quarter of all drivers on the road are female (see Table 6), they are still impaired about two thirds as often as males. Consequently, for any driver stopped, the possibility that a female driver will be impaired is almost as high as the possibility that a male driver will be impaired.

10.2.9 "Police" BAC, by Age Group

Table 40. "Police" BAC, by Age Group

Age Group:	15 to 24	25 to 29	30 to 34	35 to 39
BAC Range (mg%)				
0 -59	94.0(1.5)	92.2(2.9)	94.3(0.6)	95.8(1.7)
60 - 99	3.5(0.9)	4.3(3.0)	2.4(1.2)	0.8(0.8)
100 & over	2.8(1.5)	3.5(1.0)	3.3(1.4)	3.4(2.1)
All Drivers:	44.0(1.0)	16.2(1.2)	10.7(0.7)	8.7(0.3)

Age Group cont:	40 to 44	45 to 49	50 to 54	55 to 59
BAC Range (mg%)				
0 -59	97.3(4.8)	93.5(3.0)	99.0(0.6)	96.9(3.2)
60 - 99	2.1(4.4)	4.4(2.5)	0.4(0.6)	1.9(2.5)
100 & over	0.6(0.8)	2.1(1.5)	0.6(0.4)	1.2(2.1)
All Drivers:	6.4(2.2)	4.6(0.9)	2.9(0.6)	2.6(0.3)

Age Group cont:	60 to 64	65 to 69	70 & Over
BAC Range (mg%)			
0 -59	99.4(1.2)	97.0(3.7)	98.3(4.1)
60 - 99	0.6(1.2)	1.3(2.6)	___ (n/a)
100 & over	___ (n/a)	1.7(3.1)	1.7(4.1)
All Drivers:	2.0(0.9)	1.2(0.3)	0.7(0.3)

___ = Percentage is less than 0.05

n/a = Not Applicable

From this table, it is evident that 44 percent of all drivers on the road during the survey times are from the 15 - 24 age group. If the next age group is added, then 60 percent of all drivers on the road at night will be from the 15 to 29 year old age groups. Night-time driving is clearly a young persons' activity. This has implications for their likelihood of driving after drinking and also for their exposure to the risk of an accident.

10.2.10 "Police" BAC, by Age of Young Drivers

Table 41. "Police" BAC, by Age of Young Drivers

Age (years):	17	18	19	20
BAC Range (mg%)				
0 - 59	95.2(3.4)	95.5(4.4)	88.1(5.2)	93.8(3.0)
60 - 99	2.8(1.9)	4.1(4.3)	9.1(8.0)	3.2(2.6)
100 & over	2.0(2.5)	0.4(0.4)	2.8(4.6)	3.0(2.0)
All Drivers: 15 to 24	9.4(1.2)	13.9(1.7)	13.5(2.2)	12.1(2.4)
Age (years) cont:	21	22	23	24
BAC Range (mg%)				
0 - 59	94.6(1.7)	91.6(2.4)	93.9(4.5)	96.6(2.0)
60 - 99	3.4(2.4)	3.3(1.7)	1.8(1.0)	1.1(1.6)
100 & over	2.0(1.1)	5.1(3.5)	4.3(4.7)	2.3(1.4)
All Drivers: 15 to 24	11.6(1.3)	11.4(0.5)	10.4(2.2)	9.3(1.8)

There was one only person stopped in the survey who admitted to being 15. This person would have "passed" the breath test. No 16 year olds were in the "warn" category, although a tiny number were in the "fail category. For all intents and purposes 15 and 16 year olds do not drive after drinking and are therefore not reported upon here, to simplify the data presentation.

19 year-old drivers, that is those who for the first time were legally entitled to purchase and consume alcohol, do seem to be drinking and driving more than 17 and 18 year-olds. Unfortunately, the size of the confidence intervals in this group is so large (due to the small sample size) that it is impossible to make a definitive statement.

Drivers in the 22 and 23 year-old age group were about twice as likely to be over 100 mg% as younger drivers. Younger drivers, however, were more likely to be in the 60 - 99 BAC range which is a sufficient BAC to impair the driving abilities of these relatively unskilled drivers.

10.2.11 "Police" BAC, by Seat Belt Use

Table 42. "Police" BAC, by Seat Belt Use

Belt Use:	Wearing	Not Wearing
BAC Range (mg%)		
0 - 59	79.7(0.4)	20.3(0.4)
60 - 99	62.7(11.2)	37.3(11.3)
100 & over	56.3(16.9)	43.7(16.9)

These data show a decline in seat belt wearing with increase in BAC although, because of the large confidence intervals, it is only safe to suggest a difference between drinkers and non-drinkers.

Decreases in wearing rates with increasing BAC's have been found in other provinces. The fact that drinking-drivers tend not to wear their seat belts, may form part of an explanation for the very severe injuries associated with alcohol-related accidents.

11. Comparison of 1981 and 1987 Survey Results

The purpose of this section is to determine how impaired driving in Saskatchewan has changed between 1981 and 1987. For comparisons to be made, identical categories of variables of interest are required. For example, to compare "time of night" between 1981 and 1987, the time categories must be broken out the same way (into 1.5 hour periods) for each survey.

In some cases, such as the "age" comparison, data were obtained from an independent analysis, and was used to overcome the incompatibility between categories.

Since requirements differed from one survey to another, not all of the wished-for comparisons were possible. Some data were not available. Those comparisons which were equivalent, and for which data were available, are presented below.

To help decide if the differences between the surveys taken in different years are real differences, or merely differences brought about by chance, "t-tests" have been carried out for all suitable comparisons. The "t-tests" looked at the differences between two estimated percentages, the sample size, the standard errors (part of the confidence interval) and the number of drivers represented by each percentage.

Where the sum of drivers in 1981 and 1987 for any comparison was equal to, or fewer than 32 (giving 30 degrees of freedom for the t-test), this comparison was

rated as "not applicable for statistical comparison" (n/a) because there were too few drivers represented to make a sensible statistical test.

Once the calculation of "t" had been made, this was compared against a table of theoretical probabilities. These probabilities (expressed as a percentage) listed in the table were: 80, 90, 95, 97, 99, and 99.9. These numbers are traditionally used to determine how certain one can be that the difference is a real one, and not a difference brought about by chance. For example, a probability of 80 means that there are 80 out of 100 (or eight chances out of 10), that the difference is real - not very good odds. A probability of 99.9 means that the chances that the difference is real are 99.9 out of 100 (or 999 out of 1000) - very good odds indeed. In all cases the calculated "t" values must exceed the probabilities in the theoretical tables.

In the past, the conventional method of reporting probabilities of real differences was to choose a probability level (significance level), for example 95 and report whether the "t" value exceeded that value or not. It is now becoming conventional, in addition to making decisions of significance based on a pre-selected probability level, to also present the actual probabilities calculated, in case decision-makers are prepared to make decisions with a different level of probability. For example, it may be that the data in this report could be used to support an action where a 90% probability of the differences being real (right) is acceptable.

For this analysis the author is adopting the conventional 95% probability of differences being "real". An asterisk is placed beside each probability that exceeds 95% and, for the purposes of this report, these differences will be considered to be "real", or "significant". Any probability less than 95% are considered "not significant".

11.1 Comparison of 1981 and 1987 "Legal" BACs

11.1.1 "Legal" BACs for All Saskatchewan Drivers

Table 43. "Legal" BACs for All Saskatchewan Drivers 81 mg% & Over

1981	1987	Probab. of a Real Difference
3.2	3.6	<80

Table 44. "Legal" BACs for All Saskatchewan Drivers 60 to 80 mg%

1981	1987	Probab. of a Real Difference
2.9	2.1	* 95

From 1981 to 1987 the percentage of drivers whose BAC was over the 80mg% legal limit increased from 3.2 to 3.6 percent. This difference is not large enough to be "significant". Therefore, from a statistical point of view, there was no difference between the proportions of drivers in 1981 and 1987 whose BACs exceeded 80 mg%.

The percentages of drivers whose BACs could have resulted in a 24 hour suspension (60 to 80 mg%) **decreased** from 2.9% in 1981 to 2.1% 1987. This difference is significant, or "real", so proportionately fewer drivers became impaired at this level in 1987 than had in 1981.

11.1.2 "Legal" BAC, by Driver Age Group

Table 45. "Legal" BAC - 81 mg% & Over, by Age Group

	1981	1987	Probab. of a Real Difference
Age Group			
15 to 24	2.8	3.8	90
25 to 39	4.0	4.1	<80
40 to 59	3.6	2.6	<80
60 & over	0.6	0.9	n/a

Table 46. "Legal" BACs - 60 to 80 mg%, by Age Group

	1981	1987	Probab. of a Real Difference
Age Group			
15 to 24	3.1	2.5	<80
25 to 39	3.5	2.2	<80
40 to 59	1.2	1.3	n/a
60 & over	3.4	0.7	n/a

A comparison of impaired driving for 1981 and 1987 reveals that there were no significant differences between 1981 and 1987 for driving after drinking for any age group:

- In the 15-24 year old age group, the percentage of drivers whose BAC was over the 80 mg% legal limit increased from 2.8 to 3.8 percent. While there is a 90% probability that this is a real increase, the size of the change does not meet

the set criterion of 95%. Therefore, this difference is viewed as not significant and the change is not viewed as a "real" one. The percentage of drivers whose BAC was between 60 and 80 mg%, decreased from 3.1 to 2.5 %. This difference is not significant.

- In the 25 to 39 year old age group, the differences between 1981 and 1987 (4.0 and 4.1%) for drivers with BACs over 80 mg% are not significant. Nor was the decrease in the percent impaired between 60 and 80 mg% (from 3.5 to 2.2%) between 1981 and 1987 significant.
- In the 40 to 59 year old age group impairment over 80 mg% did not decrease significantly between 1981 and 1987 (from 3.6% to 2.6%) and there were too few drivers represented for a t-test to be meaningful for the 60 to 80 mg% range.
- In the 60 & over age group, the percentages may appear to be significant (0.6 to 0.9 and 3.4 to 0.7). However, there were too few drivers in each category to make the t-test meaningful.

11.1.3 "Legal" BAC, by Gender

Table 47. "Legal" BAC - 81 mg% & Over, by Gender

	1981	1987	Probab. of a Real Difference
Gender			
Female	3.3	2.8	<80
Male	3.2	3.9	80

Table 48. "Legal" BAC - 60 to 80 mg%, by Gender

	1981	1987	Probab. of a Real Difference
Gender			
Female	1.9	1.4	<80
Male	3.3	2.3	* 99

Despite an apparent decline in the proportions of females who drove after drinking, this change between 1981 and 1987 was not significant. The percentage drop for females with BACs over 80 mg% (3.3 to 2.8) was not significant, nor was the decrease significant for females in the 60 to 80 mg% BAC range (from 1.8 to 1.4%).

For males, there was no significant change for those over 80 mg%, but there was a significant *decrease*, between 1981 and 1987, in the proportion of drivers in the 60 to 80 mg% BAC range. In detail, the percentage of males over 80 mg% increased from 3.2 to 3.9% between 1981 and 1987, but this increase was not significant. However the percentage of males between 60 and 80 mg% significantly **decreased** (from 3.3 to 2.3%) between surveys. This finding could be interpreted as an indication of restraint by those drivers who were susceptible to educational and social pressures.

11.1.4 "Legal" BAC, by Trip Origin

Table 49. "Legal" BAC- 81 mg% & Over, by Trip Origin

	1981	1987	Probab. of a Real Difference
Trip Origin			
Home	2.0	2.8	<80
Friend/Rel Home	4.2	4.0	<80
Work	1.7	2.1	n/a
Restaurant	2.3	1.9	n/a
Bar/Tavern	13.0	15.8	<80
Recreation	4.0	2.1	n/a
Shopping	0.0	0.6	n/a

Table 50. "Legal" BAC - 60 to 80 mg%, by Trip Origin

	1981	1987	Probab. of a Real Difference
Trip Origin			
Home	3.6	1.8	80
Friend/Rel Home	4.4	2.1	90
Work	2.2	0.5	n/a
Restaurant	1.4	1.0	n/a
Bar/Tavern	4.1	8.9	80
Recreation	2.2	1.9	n/a
Shopping	1.0	1.8	n/a

Since there were a larger number of "trip origins", there are too few drivers represented in over half of the comparisons to sensibly carry out statistical tests. Where statistical tests were practical, the data show no significant changes between 1981 and 1987 for any of the trip origins.

11.1.5 "Legal" BAC, by Trip Length

Table 51. "Legal" BAC - 81 mg% & Over, by Trip Length

	1981	1987	Probab. of a Real Difference
Trip Length			
1 - 5 km	3.7	4.2	<80
6 - 10 km	4.1	1.9	* 99.9
11 - 20 km	3.3	3.8	n/a
21 - 50 km	1.2	3.2	* 97
51 - 100 km	3.1	0.9	n/a
Over 100 km	2.4	3.2	n/a

Table 52. "Legal" BAC - 60 to 80 mg%, by Trip Length

	1981	1987	Probab. of a Real Difference
Trip Length			
1 - 5 km	3.7	2.3	90
6 - 10 km	2.5	1.5	n/a
11 - 20 km	3.8	1.1	n/a
21 - 50 km	3.1	3.9	n/a
51 - 100 km	2.4	1.5	n/a
Over 100 km	0.2	0.7	n/a

The statistical tests show a significant **decrease** in drivers with BACs over 80 mg% on 6 to 10 km trips (from 4.1% to 1.9%), and a significant **Increase** for this group on 21 to 50 km trips (from 1.2% to 3.2%). It would seem that impaired drivers tended to drive on longer trips in 1987 than they did in 1981. However, since the numbers in most of the other trip-length categories were too small to permit meaningful statistical testing, it would be well to be cautious in interpreting these data.

11.1.6 "Legal" BAC, by Week-Night

Table 53. "Legal" BAC - 81 mg% & Over, by Week-Night

	1981	1987	Probab. of a Real Difference
Week-night			
Wednesday	3.1	3.2	<80
Thursday	3.0	2.6	<80
Friday	3.3	5.8	* 99.9
Saturday	3.4	2.7	<80

Table 54. "Legal" BAC - 60 to 80 mg%, by Week-Night

	1981	1987	Probab. of a Real Difference
Week-night			
Wednesday	2.8	2.5	<80
Thursday	2.4	1.2	<80
Friday	3.6	2.4	* 95
Saturday	3.0	2.4	<80

There was little change in impaired driving on Wednesday nights between 1981 and 1987 (3.1% and 3.2% of drivers over 80 mg%, 2.8 and 2.5% of drivers between 60 and 80 mg%).

Thursday nights showed some, non-significant, declines between 1981 and 1987 (from 3.0% to 2.6% for those over 80 mg%, and from 2.4% to 1.2 % for those between 60 and 80 mg%). While these differences may seem large, the end result was not significant when the large standard error for 1981 was considered.

The percentage of drivers with BACs over 80 mg% on Friday nights showed a dramatic and significant **increase** between 1981 and 1987 (from 3.3 to 5.8%). This was, however, accompanied by a significant **decrease** in the percentage of drivers whose BACs were between 60 and 80 mg% (from 3.6 to 2.4%). It would seem that, in 1987, Friday night drinkers are imbibing to a higher BAC level before driving home.

In 1987 there were fewer drivers whose BAC exceeded 80 mg% on a Saturday night than there were in 1981 (from 3.4% to 2.7%), but this drop was not significant. Moreover, there was no significant change for drivers in the 60 to 80 mg% group (3.0% in 1981 and 2.4% in 1987).

In 1987, Friday had become the night for driving following heavy drinking.

11.1.7 "Legal" BAC, by Seat Belt Usage

Table 55. "Legal" BAC - 81 mg% & Over, by Seat Belt Usage

	1981	1987	Probab. of a Real Difference
Seat Belt Usage			
Wearing	63.7	54.8	<80

Table 56. "Legal" BAC - 60 to 80 mg%, by Seat Belt Usage

	1981	1987	Probab. of a Real Difference
Seat Belt Usage			
Wearing	63.5	64.4	<80

For those drivers whose BACs were over 80 mg%, seat belt wearing decreased between 1981 and 1987 from 63.7% to 54.8%. For those drivers with BACs between 60 and 80 mg%, seat belt wearing increased marginally from 63.5% in 1981 to 64.4% in 1987. Neither change was significant.

11.1.8 "Legal" BAC, by "Think Over Legal Limit"

Table 57. "Legal" BAC - 81 mg% & Over, by "Think Over Legal Limit"

	1981	1987	Probab. of a Real Difference
Over Legal Limit			
Yes	39.5	38.1	<80

Table 58. "Legal" BAC - 60 to 80 mg%, by "Think Over Legal Limit"

	1981	1987	Probab. of a Real Difference
Over Legal Limit			
Yes	85.5	25.5	*99.9

Between 1981 and 1987, the proportion of drivers whose BACs were over 80 mg% believed that they had, in fact, exceeded the 80 mg% limit (from 39.5 to 38.1%) dropped marginally, but not significantly. However, for those whose BACs were between 60 and 80 mg%, there was a significant **decrease** in believing that they were over the 80 mg% limit (from 85.5 in 1981 to 25.5 in 1987).

This decrease is worthy of investigation. Perhaps drivers in the 60 to 80 mg% group were a more informed group and counted their drinks. On the other hand, this group have shown what is an historically low (if more accurate) assessment of its degree of legal impairment.

11.2 Police BACS

11.2.1 "Police" BAC Distribution of All Saskatchewan Drivers

Table 59. "Police" BAC Distribution of All Saskatchewan Drivers 100 mg% & Over

1981	1987	Probab. of a Real Difference
1.9	2.7	* 99

Table 60. "Police" BAC Distribution of all Saskatchewan Drivers 60 to 99 mg%

1981	1987	Probab. of a Real Difference
4.4	3.0	90

There was a significant increase, between 1981 and 1987, in the percentage of drivers with BACs of 100 mg% and over (1.9 to 2.7%). Correspondingly, between 1981 and 1987, there was a decrease in the percentage of drivers whose BACs were between 60 and 99 mg% (from 4.4 to 3.0%), although this decrease was not significant.

It would appear that while almost as many drivers were driving after drinking in 1987 as in 1981, those doing so were drinking to higher levels of impairment.

11.2.2 "Police" BAC, by Gender

Table 61. "Police" BAC - 100 mg% & Over, by Gender

	1981	1987	Probab. of a Real Difference
Gender			
Female	0.8	1.9	n/a
Male	2.2	3.0	* 97

Table 62. "Police" BAC - 60 to 99 mg%, by Gender

	1981	1987	Probab. of a Real Difference
Gender			
Female	4.4	2.2	* 99
Male	4.5	3.2	80

Females are dramatically reducing their driving after drinking at lower levels of impairment, while males seem to be drinking to higher levels of impairment.

The increase in females with BACs over 100 mg% increased from 0.6% in 1981 to 1.9% in 1987, but this increase was not significant. However, the proportion of males with BACs greater than 100 mg% significantly **increased** from 2.2% in 1981 to 3.0% in 1987.

For those drivers with BACs between 69 and 99 mg%, the proportion of females **decreased** significantly (from 4.4% to 2.2%). Males also decreased (from 4.5% to 3.2%), although the decrease was not large enough to be significant.

11.2.3 "Police" BAC, by Age Group

Table 63. "Police" BAC - 100 mg% & Over, by Age Group

	1981	1987	Probab. of a Real Difference
Age Group			
15 to 24	1.7	2.8	90
25 to 39	2.2	3.4	90
40 to 59	2.0	1.5	n/a
60 & over	0.3	0.9	n/a

Table 64. "Police" BAC - 60 to 99 mg%, by Age Group

	1981	1987	Probab. of a Real Difference
Age Group			
15 to 24	4.4	3.5	<80
25 to 39	5.4	2.9	90
40 to 59	2.8	2.4	n/a
60 & over	3.7	0.7	n/a

Between 1981 and 1987, the proportion of drivers with BACs over 100 mg% increased from 1.7% to 2.8% in the 15 to 24 year old age group, and from 2.2% to 3.4% in the 25 to 39 year old age group. However, these differences were not significant.

A similar comparison of drivers with BACs between 60 and 99 mg% showed decreases from 4.4% to 3.5% for the 15 to 24 year olds, and from 5.4% to 2.9% for 25 to 39 year olds. Again, these differences were not significant.

There were too few impaired drivers in the older two age groups to make a valid statistical test.

11.2.4 "Police" BAC, by Trip Origin

Table 65. "Police" BAC- 100 mg% & Over, by Trip Origin

	1981	1987	Probab. of a Real Difference
Trip Origin			
Home	1.3	1.9	* 95
Friend/Rel Home	2.6	3.1	<80
Work	1.3	1.4	n/a
Restaurant	2.0	1.8	n/a
Bar/Tavern	7.3	13.1	<80
Recreation	1.6	0.6	<80
Shopping	0.0	0.4	n/a

Table 66. "Police" BAC - 60 to 99 mg%, by Trip Origin

	1981	1987	Probab. of a Real Difference
Trip Origin			
Home	4.7	2.7	<80
Friend/Rel Home	6.0	3.0	* 95
Work	2.6	1.2	n/a
Restaurant	2.3	1.1	n/a
Bar/Tavern	9.8	11.6	<80
Recreation	4.7	3.4	<80
Shopping	1.0	2.0	n/a

The only significant changes in trip origin for drivers with a BAC in equal to or excess of 100 mg% was for drivers coming from "home" which **increased** from 1.3% in 1981 to 1.9% in 1987. While it might appear that the increase in drivers coming from bars is dramatic, the confidence intervals associated with these numbers were so wide (see Table 36), that the differences were not significant.

The proportion of drivers whose BACs were between 60 and 99 mg%, and who began their trips at a friend or relatives' home **decreased** significantly between 1981 and 1987.

11.2.5 "Police" BAC, by Week-Night

Table 67. "Police" BAC - 100 mg% & Over, by Week-Night

	1981	1987	Probab. of a Real Difference
Week-night			
Wednesday	2.0	1.7	<80
Thursday	1.4	1.4	<80
Friday	2.0	4.8	* 99.9
Saturday	2.2	1.8	<80

Table 68. "Police" BAC - 60 to 99 mg%, by Week-Night

	1981	1987	Probab. of a Real Difference
Week-night			
Wednesday	3.9	4.0	<80
Thursday	4.6	2.2	<80
Friday	5.0	2.9	* 99.9
Saturday	4.2	3.3	<80

On Friday nights, drivers were drinking to higher levels of impairment. There was a significant **increase**, between 1981 and 1987, in the percentage of drivers with BACs of 100 mg% and over (2.0% to 4.8%) who drove after drinking on Friday nights. Correspondingly, there was a significant **decrease**, on Friday nights, in the percentage of drivers whose BAC was in the 60 to 99 mg% range.

On Wednesday, Thursday and Saturday nights there were no significant changes in driving after drinking between 1981 and 1987.

11.2.6 "Police" BAC, by Seat Belt Usage

Table 69. "Police" BAC - 100 mg% & Over, by Seat Belt Usage

	1981	1987	Probab. of a Real Difference
Seat Belt Usage			
Wearing	72.3	56.3	<80

Table 70. "Police" BAC - 60 to 99 mg%, by Seat Belt Usage

	1981	1987	Probab. of a Real Difference
Seat Belt Usage			
Wearing	60.0	62.7	<80

These data show a decrease in seat belt wearing by drivers with BACs greater than 100 mg%, from 72.3% in 1981 to 56.3% in 1987. However, this decrease was not significant. The slight increase shown in seat belt wearing for drivers whose BACs were between 60 and 99 mg% was not significant.

12. References

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Appendix A
Sampling Design and Details of Weighting

Sampling Design and Details of Weighting

Sampling Design

To take a measurement (such as the extent of driving after drinking in Saskatchewan), the theoretically ideal way would be to measure everyone on the road during the times of interest. However, from both a cost and practicality stance, this is impossible. The alternative is to take a scientific probability-based sample to **estimate** the measure in the population (the group that the results are to be applied to) that is, Saskatchewan drivers on the roads at night.

When this survey was designed (in this case by the Statisticians in Transport Canada), a great deal of care was taken to make sure that the estimate would be as precise as possible.

The first design decisions to be made were: What basic type of survey would be required? What kind of sampling would be required?

The two basic methods of sampling are **random sampling** and **proportional sampling**. The first option (random sampling) was to develop a truly random sample of the population. This was not practical for this survey, because of the exorbitant cost of having a crew waiting for a vehicle on roads where traffic volume is low.

The second option (proportional sampling) was to develop a sample that was in some way proportional to the population, and yet covered most of the province and all of the times of night and days of the week. Again, there were limitations, both in the cost associated with being able to survey the large number of sites required, and in the fact that not that many really good sites exist for carrying out the survey.

Where the skill came in, in designing the survey, was to balance the restrictions of cost, time and available sites, against the statistical requirements for accurate data. What resulted was a Canadian method of sampling for this survey, which was an elegant compromise, which gave very good data, and which was highly cost-effective.

This is how it worked.

The first step was to start by defining the population to be sampled. This was all the drivers on the roads in Saskatchewan, in and around all towns with populations over 5000, at the times and nights chosen for the survey. This restriction was imposed for cost purposes, but in any case, most of the Saskatchewan driving population was covered.

The province was divided into six groups of 16 sites. These were:

Lloydminster and North Battleford,
Prince Albert and Melfort,
Saskatoon,
Regina,
Melville, Yorkton and Estevan, and
Moose Jaw and Weyburn.

The reason for the 16 sites was to make sure that each of the four nights and each of the four time periods were covered in every group (see above). (Also, a crew can survey 4 sites a night, and multiples of four make travel more practical.)

Sites were selected in a way that was practical and that avoided any obvious bias (such as setting up outside Bars). See section 2.3.2.

Vehicles were selected from the traffic stream in a way that avoided any bias (such as picking out sports cars or tuned-up half tons). See section 2.3.3.

If the design stopped at this point, the survey would produce a measure of the drivers sampled, but not an estimate of the Saskatchewan population. Any inferences made would be true for the sample obtained, but would not be true for all Saskatchewan drivers at night, nor would it permit comparison of the results with previous, or subsequent, surveys.

The reason that the sample would not represent the Saskatchewan population can be seen by looking at where the sample was obtained from. Note that some groups of 16 sites have fewer drivers who could be on the road than other groups. For example, Melville, Yorkton and Estevan have a combined driving population of 24,209. Regina has a driving population of 117,282. Yet each group-of-16 sites contributed about the same number of interviews to the Saskatchewan total. To compensate for the disparity in the populations associated with the groups of 16 sites, it was necessary to "weight" the data.

There is yet another problem. When a sample was obtained from the passing traffic, it should have reflected the fact that different proportions of the passing traffic (the traffic count) were sampled at different sites. Suppose 50 vehicles were selected out of a passing 200, should the contribution to the provincial data be the same as if 50 vehicles were selected out of 1000 passing vehicles? No - because the sample from the total number of drivers on the road would be different in each case. This can, however, be corrected by weighting.

See McCarthy, 1965, and Plackett and Burman, 1943-6, for a more technical discussion of the issues expressed above.

Weighting the Data

Essentially what weighting does is to correct the sample so that the data best reflect the characteristics of Saskatchewan's night-time drivers.

The two weights applied to this survey correct for the licensed drivers and the traffic volumes in each of the blocks-of-16.

Weighting for Licensed Drivers

The first weight calculated reflected the total number of people who could have been sampled at our sites. To do this a ratio of Licensed Drivers to Traffic Volume was developed. That was:

Total Number of Licensed Drivers in a Group of 16 Sites

Total Traffic Volume Measured for the Group of 16 Sites

The number from this calculation provided a group-of-16 weight which was applied to the data from each site.

Weighting for Traffic Volume

The second weight which was calculated reflected the traffic count.

The way that the weight for traffic volume was assigned was by the following calculation:

Traffic Count at a Site

Drivers Selected for Interview at a Site

This number produced a weight. See Table 69 for the way a weight can be used.

To obtain the total weighting for any particular site, it was necessary to multiply the group-of-16 weight that is associated with that site by the weight derived from the traffic count. What the weighting was doing was to make the sampling proportional to the population. This, then, provided the opportunity to use the weighted datum as a measure of the population and to compare different surveys.

The following example, showing how weighting could affect sites with different traffic counts, is taken from the report on the 1981 Survey (Hieatt, 1981).

Table 71. Example of the Effect of Weighting for Four Sites with Different Traffic Counts

<u>Site</u>	<u>Observed No. Drivers</u>	<u>No. Impaired</u>	<u>Traffic</u>	<u>Sampling Propn.</u>	<u>Weighted</u>		<u>No.</u>
					<u>Weight</u>	<u>Impaired</u>	
1	50	2	1000	1/20	20		40
2	50	3	800	1/16	16		48
3	50	5	400	1/8	8		40
4	50	6	200	1/4	4		24
—	200	16	2400				152

Using the numbers from the Table above, the unweighted estimate would be 16/200 equals 8% impaired.

Using the weighted numbers which allow for traffic volume, the weighted estimate would be 152/2400 which equals 6.33% impaired.

So, in this case, using unweighted numbers would over-estimate the proportion of impaired drivers.

Appendix B
Interview Form

ROADSIDE SURVEY OF DRIVER'S ALCOHOL USE

SITE NO.		DRIVER SEAT BELT USE 1 NOT IN USE 2 LAP & SHOULDER 3 LAP BELT ONLY 4 NOT FITTED 5 MOTORCYCLE 8 CAN'T TELL 9 REFUSED / MISSED		WHERE MOST OF DRINKING TO-NIGHT (IF BAC > 20 MG%) 0 IN THE VEHICLE 1 OWN HOME 2 FRIEND / RELATIVE'S HOME 3 RESTAURANT 4 BAR / CLUB/TAVERN 5 SPECIAL LICENCE 6 BAC < 21 MG% 7 OTHER (NOTE) 8 DON'T KNOW 9 REFUSED	
DATE		NO. OF OCCUPANTS (INCLUDING DRIVER) ACTUAL NO. 1 TO 7 8 MORE THAN 7 9 MISSED / REFUSED		ANYONE DISCOURAGE YOU? (IF BAC > 20 MG%) 1 NO 2 YES 6 BAC < 21 MG% 8 DON'T KNOW 9 REFUSED	
NIGHT 1 WED 3 FRI 2 THURS 4 SAT		DRIVER'S AGE 01 15-24 02 25-29 03 30-34 04 35-39 05 40-44 06 45-49 07 50-54 08 55-59 09 60-64 10 65-69 11 70 & OVER 99 REFUSED		ANYONE CONSUMED ALCOHOL (IF BAC < 21 MG% AND MORE THAN ONE OCCUPANT) 1 NO 2 YES 6 NOT APPLICABLE 8 DON'T KNOW 9 REFUSED	
INTERVIEWER / SEQUENCE NO.		IF AGE UNDER 25 ACTUAL NO. 15 TO 24 00 25 & OVER 99 REFUSED		IF YES DID THIS DETERMINE WHO DROVE 1 NO 2 YES 6 NOT APPLICABLE 8 DON'T KNOW 9 REFUSED	
ALERT NO.		OF 100 LEGALLY IMPAIRED NUMBER STOPPED BY POLICE ACTUAL NO. 000 to 100 888 DON'T KNOW 999 REFUSED		EVER TAKEN DWI COURSE 1 NO 2 YES 6 NOT APPLICABLE 8 DON'T KNOW 9 REFUSED	
TIME OF INTERVIEW 1 9:00-10:30 PM 2 10:30-12:00 PM 3 12:00-01:30 AM 4 01:30-03:00 AM		DRINKS IN 7 DAYS ACTUAL NO. 00 TO 70 77 70 PLUS 88 CAN'T ESTIMATE 99 REFUSED		LICENCE SUSPENDED FOR IMPAIRED DRIVING 1 NO 2 YES 8 DON'T KNOW 9 REFUSED	
VEHICLE TYPE 1 PASSENGER CAR 2 1/2 TON / LIGHT TRUCK 3 VAN 4 MOTORCYCLE 7 OTHER (NOTE) 9 MISSED		TIME SINCE LAST DRINK BAC READING 777 DEF. EQUIPMENT 888 INSUFF. BLOW 999 REFUSED			
LICENCE PLATE 1 SASKATCHEWAN 2 OTHER PROVINCE 3 U.S. 7 OTHER (NOTE) 9 MISSED		THINK OVER LEGAL LIMIT? (IF BAC > 20 MG%) 1 NO 2 YES 6 BAC < 21 8 DON'T KNOW 9 REFUSED			
ORIGIN / ESTABLISHMENT 0 OWN HOME 1 FRIEND / RELATIVE HOME 2 WORK 3 RESTAURANT 4 BAR / CLUB / TAVERN 5 REC. ACTIVITY 6 SHOPPING / MEETING 7 OTHER (NOTE) 8 DON'T KNOW 9 REFUSED					
LENGTH OF TRIP ACTUAL NO. 001 TO 800 850 MORE THAN 800 888 CAN'T ESTIMATE 999 REFUSED					
MILES OR KILOMETRES 1 MILES 2 KILOMETRES 8 DON'T KNOW 9 REFUSED					
DRIVER GENDER 1 FEMALE 2 MALE 9 MISSED / REFUSED					

CONTINUED ON BACK

NOTES:

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Interview # BAC

RG-34 (5-87)

WHY REFUSED INTERVIEW	WHY REFUSED BREATH SAMPLE
1 ACCEPTED	1 ACCEPTED / DEF EQUIP / INSUFF BLOW
2 LANGUAGE PROBLEM	2 LANGUAGE PROBLEM
3 NOT INTERESTED / IN A HURRY	3 NOT INTERESTED / IN A HURRY
4 ABUSIVE / UNCOOPERATIVE	4 ABUSIVE / UNCOOPERATIVE
5 AGAINST CIVIL RIGHTS	5 AGAINST CIVIL RIGHTS
6 FEAR OF PROSECUTION	6 FEAR OF PROSECUTION
7 OTHER (NOTE)	7 MEDICAL
8 DON'T KNOW / NO REASON ☐ 50	8 DON'T KNOW / NO REASON ☐ 51
9 MISSED	9 REFUSED INTERVIEW / MISSED

RECORD OUTCOME OF 60 MG PLUS	RECORD OUTCOME OF REFUSALS
1 UNDER 60 MG / REFUSED BAC	1 ACCEPTED
2 LET GO	2 LET GO
3 SWAP DRIVERS	3 SWAP DRIVERS
4 TAXI / RIDE	4 TAXI / RIDE
5 WALK	5 WALK
6 POLICE ARREST	6 POLICE ARREST
7 OTHER (NOTE)	7 OTHER (NOTE)
9 DON'T KNOW / MISSED ☐ 52	9 DON'T KNOW / MISSED ☐ 53

Appendix C
Site Report

CITY _____ START TIME 9 10:30 MN 1:30
 SITE# 6 / / / / / / / / DATE ____/____/ 1987
 LOCATION _____ DAY OF THE WEEK W T F S

Direction of Traffic: N S E W Direction: to city from city N/
 Posted Speed Limit: 40 50 60 70 80 90 100
 Estimated Speed: 40 50 60 70 80 90 100
 Distance to Nearest Phone:
 Location of Nearest Phone:
 Supplementary Lights Needed: Y N
 Owner's Name:
 Owner's Approval Obtained:
 Owners/Designates Phone # :
 Hours Available:
 Restrictions/Remarks:

SITE RATING:

	Excellent	Satisfactory
Sight Distance	___	___
Entrance	___	___
Exit	___	___
Road Surface	___	___
Parking	___	___
Lighting	___	___
Phone	___	___
Escape-Proof	___	___
Obstacle Free	___	___
Communication(Police)	___	___
Estimated Volume	___	___

Overall Rating
E
S
In Line _____
2 and 1 _____
3 Side by/ side _____

Appendix D
Site Summary Form

SITE SUMMARY SHEET

A) CITY/TOWN		N) SITE STATUS: 1. SITE COMPLETE 2. SITE PARTIALLY COMPLETE 3. SITE CANCELLED	
D) SITE DESCRIPTION		I) YEAR MONTH DAY	
(C) IF CANCELLED, REASON		J) COUNT	
D) CREW CHIEF		K) INTERVIEWED	
(E) CREW (FIRST NAME + LAST INITIAL)		L) DRIVERS	
F) POLICE FORCE		M) STATUS	
G) POLICE OFFICERS (NAMES)			
H) BAC READING:		O) INTERVIEW REFUSAL RATE: $\frac{\text{VEH. SEL. (K)}}{\text{VEH. SEL. (K)}} \times \frac{100}{1} = \%$	
1 888	2 999	P) DAC REFUSAL RATE: $\frac{\text{DR. INT. (L)}}{\text{VEH. SEL. (K)}} \times \frac{100}{1} = \%$	
3 0-20	4 21-50	Q) TOTAL REFUSALS: INT. REFUSAL RATE (O) + DAC REFUSAL RATE (P) = %	
5 51-80	6 81-100		
7 101 PLUS	8 TOTAL (U) 333-101 +		
9 TOTAL 1-9 (V)	10 TOTAL 10+ (W)		
S) OUTCOME OF 81 & OVER			
1 2	3 3		
4 4	5 5		
6 6	7 7		
8 8	9 9		
T) OUTCOME OF REFUSAL:			
1 2	3 3		
4 4	5 5		
6 6	7 7		
8 8	9 9		
TOTAL 1-9 (Y)		TOTAL 10-9 (Z)	